

What is claimed is:

- 1 1. A power supply system, comprising:  
2 a first voltage source having a first output at a first voltage;  
3 a second voltage source having a second output at a second voltage  
4 approximately equal to the first voltage; and  
5 a circuit element having a plurality of power connection terminals and a  
6 plurality of return connection terminals, wherein a first portion of the plurality of  
7 power connection terminals and a first portion of the plurality of return connection  
8 terminals are connected to the first output, and wherein a second portion of the  
9 plurality of power connection terminals and a second portion of the plurality of  
10 return connection terminals are connected to the second output.
- 1 2. The power supply system of claim 1, wherein the first and second voltage  
2 sources are included in a single voltage regulator.
- 1 3. The power supply system of claim 1, wherein the first voltage source is  
2 included in a first voltage regulator and the second voltage source is included in a  
3 second voltage regulator.
- 1 4. The power supply system of claim 3, wherein the first output includes a first  
2 phase and the second output includes a second phase, further comprising:  
3 a phase synchronizing connection between the first and second voltage  
4 regulators.
- 1 5. The power supply system of claim 1, wherein the circuit element is a  
2 microprocessor.
- 1 6. The power supply system of claim 1, wherein the circuit element is a socket.

1 7. The power supply system of claim 1, further comprising:  
2 a third voltage source having a third output at a third voltage approximately  
3 equal to the first voltage, wherein a third portion of the plurality of power  
4 connection terminals and a third portion of the plurality of return connection  
5 terminals are connected to the third output.

1 8. The power supply system of claim 7, further comprising:  
2 a fourth voltage source having a fourth output at a fourth voltage  
3 approximately equal to the first voltage, wherein a fourth portion of the plurality of  
4 power connection terminals and a fourth portion of the plurality of return connection  
5 terminals are connected to the fourth output.

1 9. The power supply system of claim 8, wherein the first output includes a first  
2 phase, the second output includes a second phase, the third output includes a third  
3 phase, and the fourth output includes a fourth phase, further comprising:  
4 a phase synchronizing connection between the first, second, third, and fourth  
5 voltage sources.

1 10. The power supply system of claim 1, wherein the first portion of the  
2 plurality of power connection terminals is equal to the first portion of the plurality  
3 of return connection terminals, and wherein the second portion of the plurality of  
4 power connection terminals is equal to the second portion of the plurality of return  
5 connection terminals.

1 11. A circuit board, comprising:  
2 a circuit card;  
3 a first voltage source attached to the circuit card and having a first output at  
4 a first voltage;  
5 a second voltage source attached to the circuit card and having a second  
6 output at a second voltage approximately equal to the first voltage; and

7 a circuit element attached to the circuit card and having a plurality of power  
8 connection terminals and a plurality of return connection terminals, wherein a first  
9 portion of the plurality of power connection terminals and a first portion of the  
10 plurality of return connection terminals are connected to the first output using a first  
11 plurality of traces on the circuit card, and wherein a second portion of the plurality  
12 of power connection terminals and a second portion of the plurality of return  
13 connection terminals are connected to the second output using a second plurality of  
14 traces on the circuit card.

1 12. The circuit board of claim 11, wherein the circuit element is a  
2 microprocessor.

1 13. The circuit board of claim 11, wherein the circuit element is a socket.

1 14. The circuit board of claim 11, wherein the first and second voltage sources  
2 are included in a single voltage regulator.

1 15. The circuit board of claim 11, wherein the first voltage source is included in  
2 a first voltage regulator and the second voltage source is included in a second  
3 voltage regulator.

1 16. The circuit board of claim 15, wherein the first output includes a first phase  
2 and the second output includes a second phase, further comprising:  
3 a phase synchronizing connection between the first and second voltage  
4 regulators.

1 17. A computer, comprising:  
2 a microprocessor mounted in a socket having a plurality of power  
3 connection terminals and a plurality of return connection terminals;

4 a first voltage source having a first output at a first voltage connected to a  
5 first portion of the plurality of power connection terminals and a first portion of the  
6 plurality of return connection terminals; and  
7 a second voltage source having a second output at a second voltage  
8 approximately equal to the first voltage, wherein the second output is connected to a  
9 second portion of the plurality of power connection terminals and a second portion  
10 of the plurality of return connection terminals.

1 18. The computer of claim 17, wherein the first and second voltage sources are  
2 included in a single voltage regulator.

1 19. The computer of claim 17, wherein the first voltage source is included in a  
2 first voltage regulator and the second voltage source is included in a second voltage  
3 regulator.

1 20. The computer of claim 19, wherein the first output includes a first phase and  
2 the second output includes a second phase, further comprising:  
3 a phase synchronizing connection between the first and second voltage  
4 sources.

1 21. A method of providing power to a circuit element, comprising:  
2 selecting a first portion of a plurality of power connection terminals  
3 electrically coupled to the circuit element;  
4 selecting a first portion of a plurality of return connection terminals  
5 electrically coupled to the circuit element;  
6 connecting a first output supplied at a first voltage of a first voltage source to  
7 the first portions of the pluralities of power and return terminals;  
8 selecting a second portion of the plurality of power connection terminals  
9 electrically coupled to the circuit element;  
10 selecting a second portion of the plurality of return connection terminals  
11 electrically coupled to the circuit element; and

12 connecting a second output of a voltage source to the second portions of the  
13 pluralities of power and return terminals, wherein the second output is supplied at a  
14 second voltage approximately equal to the first voltage.

1 22. The method of claim 21, wherein the first and second phase outputs are  
2 supplied by a single voltage regulator.

1 23. The method of claim 21, wherein the first output is supplied by a first  
2 voltage regulator and the second output is supplied by a second voltage regulator.

1 24. The method of claim 23, wherein the first output includes a first phase and  
2 the second output includes a second phase, further comprising:  
3 inserting a phase synchronizing connection between the first and second  
4 voltage regulators.

1 25. The method of claim 21, wherein the circuit element is a microprocessor.

1 26. The method of claim 21, wherein the circuit element is a socket.